Patent

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: STEVE A. NIXON	Docket No: ACO 2799 US
Serial No: 09/888,696	Examiner: M.G. Moore
Filing Date: June 25, 2001	Group Art Unit: 1712
Title: AMBIENT TEMPERATURE CURING COATING COMPOSITION	

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on April 28, 2004

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APPEAL BRIEF

This is an appeal from the Final Rejection of Claims 1-4 and 9-18, dated June 20, 2003.

The text of the rejected Claims is reproduced in the Appendix attached as last section to this Appeal Brief.

REAL PARTY IN INTEREST

The real party in interest for this Appeal is Akzo Nobel N.V., Arnhem, The Netherlands.

RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences to the instant appeal.

STATUS OF CLAIMS

Claims 1-4 and 9-18 are pending in the instant application and all have been rejected.

STATUS OF AMENDMENTS

All Amendments have been entered, and two Responses were interposed after Final Rejection.

SUMMARY OF INVENTION

The invention relates to an ambient temperature curing coating composition comprising more than 70% by weight solids. It comprises a polysiloxane (as depicted and characterized in Claim 1), an alkoxysilyl-functional acrylic polymer, and (optionally) water, as curing agent.

ISSUES

The issues presented for Appeal are whether it was correct for the Examiner to reject Claims 1-4 and 9-18 as unpatentable over the Yamaki et al. patent (U.S. Patent No. 5,902,851).

GROUPING OF CLAIMS

All of the pending Claims stand together for purposes of this Appeal.

ARGUMENT

Claims 1-4, and 9-18 are rejected under 35 U.S.C. 103(a) for allegedly being unpatentable based on Yamaki. This rejection is respectfully traversed.

It is well established that to establish a *prima facie* case of obviousness, the Patent and Trademark Office must satisfy *all* of the following requirements. First, *the prior art relied upon*, coupled with the knowledge generally available in the art at the time of the invention, must contain some suggestion or incentive that would have motivated the person of ordinary skill in the art to modify a reference or to combine references. *In re Fine*, 5 U.S.P.Q.2d 1596,

1598 (Fed. Cir. 1988). Second, the proposed modification must have had a reasonable expectation of success, as determined from the vantage point of one of ordinary skill in the art at the time the invention was made. *Amgen v. Chugai Pharmaceutical Co.*, 18 U.S.P.Q.2d 1016, 1023 (Fed. Cir. 1991, cert. denied, 502 U.S. 856 (1991). Third, the prior art references or combination of references must teach or suggest all of the limitations of the claims. *In re Wilson*, 165 U.S.P.Q. 494, 496 (C.C.P.A. 1070). In the present situation, the Examiner has not established a *prima facie* case of obviousness.

The coating composition of the claimed invention comprises more than 70% by weight solids, as disclosed in the specification, for example, on page 1 at lines 8-9. This claimed invention is patentably distinguishable from Yamaki at least based on the claimed high solids content. The Advisory Action of October 22, 2003 contended that since Yamaki does not require any solvent, it reads on any solids content. There is simply no support for this statement in Yamaki.

Thus, it is submitted that Yamaki does not teach or even suggest how to make its composition with a high solids content (namely, more than 70% solids by weight, as claimed by the applicant) and, thus, Yamaki *does not meet the enablement requirements of 35 U.S.C. 112, first paragraph.*

Yamaki does not state or anywhere imply that no solvent is required. Indeed, Yamaki clearly uses solvents in its processing steps and does not disclose any means for removing them or otherwise increasing the solids content. In fact, at Col. 21, lines 27-32 it teaches the *further dilution* of the mixed components with isopropanol so that "each solid content was 20%, to obtain resinous compositions for foul releasing coat" (at lines 29-30). This particular statement would clearly push the person of ordinary skill

in the art towards much lower solid content characteristics in the coating than is required by pending Claim 1.

It has now been found that it is possible to prepare coating compositions, having a solid content of more than 70 weight percent, comprising a polysiloxane and an alkoxysilyl-functional polymer. For example, the present specification discloses at page 6, lines 4-7 that such a coating can be prepared by preparing the alkoxysilyl-functional acrylic polymer in the presence of a reactive diluent. Such a high solid content is advantageous since the coating compositions according to the present invention comply with current VOC requirements.

There is no suggestion or expressed expectation of success in Yamaki that would have led the person of ordinary skill in the art to remove solvent from its coating composition. To the contrary, at Col. 13, lines 32-53, Yamaki clearly advises the even further dilution (i.e. to increase the solvent content) the prepared compositions "for easiness of handling". In the examples, the coating compositions are diluted such that each mixture has a solid content of only 20%, see column 21, lines 27-33.

Although this teaching in Yamaki is described as being "optional" in the present Office Action, it is still the only teaching of solids content in Yamaki. Yamaki simply does not teach or suggest a solids content or more than 70 weight percent or that the solids content should be increased. Hence, decreasing the solvent content (to end up at a higher solids level) is contrary to the teaching of Yamaki and would, therefore, not be considered by the skilled person.

The present application discloses that the claimed high solids content can be achieved by taking positive steps, for example, by preparing the alkoxysilyl-functional acrylic polymer in the presence of a reactive diluent. (see Page 6, lines 4-7).

Another way of achieving a high solids content is disclosed in U.S. Patent Publication No. 2002/0011177 (Yamamori et al.), which states at page 1, in paragraph 4 that it is an object of their invention to provide a high-solid antifouling coating. At page 1, in paragraph 18, it is indicated that a composition having a VOC of not more than 400 g/L is to be obtained. At page 2, in paragraph 20, it is explained what is necessary, in terms of the acrylic resin, to obtain a high solids composition that would be suitable as a coating composition. At page 3, in paragraph 29 it is further explained how such an acrylic resin can be prepared.

Yamaki neither teaches nor suggests any means for achieving a high solids content in their compositions. Yamaki's disclosure that solvents can be added to further dilute the composition certainly does not provide any teaching or suggestion of a means for achieving a high solids content product. Yamaki utilizes solvents in its processing steps and does not remove them, so there is no basis for the person of ordinary skill in the art to think that the composition disclosed in Yamaki would have a high solids content. This is further discussed below.

Yamaki relates to compositions comprising components A, B, C, and D. As recognised by the Examiner, component A, which is a silica-dispersed oligomer solution of an organosilane, has a low solids content. This is confirmed by Preparation Examples A-1 and A-2 where silica-dispersed oligomer solutions of organosilane are obtained that have a solids content of 36%. This is far below the 70% threshold value recited in applicant's Claim 1.

Yamaki explains at Col. 9, lines 40-45, that the acrylic resin (B) can be obtained by a known synthesis method, for example, by radical polymerization, anion polymerization, or cation polymerization. These polymerizations can be performed by suspension polymerization, emulsion polymerization or solution

polymerization. An example is given, at Col. 9, lines 46-52, of a method for radical polymerization by solution polymerization.

Suspension polymerization, emulsion polymerization, and solution polymerization all require a liquid in which the polymerization takes place. This is well known in the art. Hence, these polymerization processes will result in an acrylic resin (B) having a low solids content. This is confirmed by Preparation Examples B-1 to B-4 in Yamaki, where 40% toluene solutions of acrylic resins are obtained. Again, This is far below the 70% threshold value recited in applicant's Claim 1.

The polyorganosiloxane (D) can be obtained, for example, by hydrolysis, with an abundant quantity of water in a known manner as indicated at Col. 11, lines 40-46 of Yamaki. Though the description does not further elaborate on such methods, an example of a preparation method can be found in Preparation Example D-1 at Col. 20, lines 42-63 of Yamaki. In this Example, the hydrolysis of silanes utilizing plenty of water is performed with the additional presence of a mixture of acetone and toluene. The result is a 60% toluene solution of a polyorganosiloxane. Yet again, this is far below the 70% threshold value recited in applicant's Claim 1.

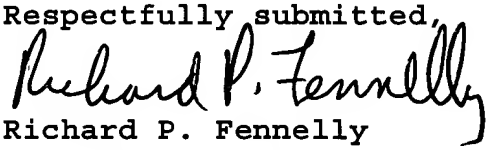
Hence, in the various preparative methods suggested by Yamaki, not only component A, but also components B and D have a solids content that is far below the 70% threshold value recited in applicant's Claim 1. Consequently, a mixture of A, B, C and D prepared according to the teaching of Yamaki necessarily would have such a low solids content. This is confirmed by the Examples contained in that cited patent. According to Col. 13, lines 32-33 of Yamaki, such a composition is even further diluted, which is clearly illustrated in the Examples (see Col. 21, lines 28-33).

In accordance with the above discussion, Yamaki provides no guidance whatsoever to the person of ordinary skill in the art about

any type of coating composition having a high solids content, such as required by the pending Claims. Thus, the claimed invention, which has more than 70% solids on a weight basis, cannot be said to be obvious based on a review of the Yamaki patent.

For all of the reasons provided herein, the Board is requested to reverse each of the Examiner's rejections.

Respectfully submitted,



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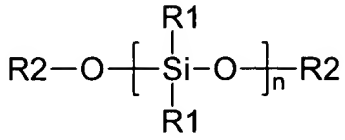
APPENDIX

THE REJECTED CLAIMS

1. Ambient temperature curing coating composition comprising



- a polysiloxane having the formula

wherein each R1 is selected from alkyl, aryl, and alkoxy groups having up to six carbon atoms, reactive glycidoxy groups, and $OSi(OR3)_3$ groups, wherein each R3 independently has the same meaning as R1, each R2 is selected from hydrogen and alkyl and aryl groups having up to six carbon atoms, and wherein n is selected so that the molecular weight of the polysiloxanes is in the range of from 500 to about 2,000, and

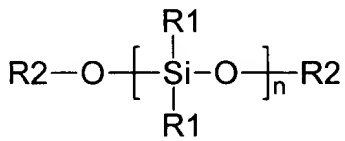
- an alkoxysilyl-functional acrylic polymer

- optionally water as curing agent,

wherein said coating composition comprises more than 70% by weight solids.

2. Ambient temperature curing coating composition comprising

- a polysiloxane having the formula



wherein each R1 is selected from alkyl, aryl, and alkoxy groups

having up to six carbon atoms, reactive glycidoxy groups, and $OSi(OR3)_3$ groups, wherein each R3 independently has the same meaning as R1, each R2 is selected from hydrogen and alkyl and aryl groups having up to six carbon atoms, and wherein n is selected so that the molecular weight of the polysiloxanes is in the range of from 500 to about 2,000, and

- an alkoxysilyl-functional acrylic polymer

- an amino-functional compound,

wherein the amino-functional compound is an aminosilane of general formula $Y-Si-(O-X)_3$, wherein Y is $H(HNR)_a$ and a is an integer from one to six, each R is a difunctional organic radical independently selected from aryl, alkyl, dialkylaryl, alkoxyalkyl, and cycloalkyl radicals, and R can vary within each Y molecule, each X may be the same or different, and is limited to alkyl, hydroxyalkyl, alkoxyalkyl, and hydroxyalkoxyalkyl groups containing fewer than about six carbon atoms, and

wherein said coating composition comprises more than 70% by weight solids.

3. Ambient temperature curing coating composition according to claim 1 wherein the alkoxysily-functional acrylic polymer is prepared from a mixture of at least three different olefinically unsaturated monomers and that said mixture is reacted in the presence of a polysiloxane, wherein at least one of the monomers is an alkoxysilyl-functional olefinically unsaturated monomer.

4. Ambient temperature curing coating composition according to claim 2 wherein the alkoxysily-functional acrylic polymer is

prepared from a mixture of at least three different olefinically unsaturated monomers and that said mixture is reacted in the presence of a polysiloxane, whereby at least one of the monomers is an alkoxysilyl-functional olefinically unsaturated monomer.

9. A finish coating and/or primer coating comprising the coating composition of claim 1.

10. A finish coating and/or primer coating comprising the coating composition of claim 2.

11. A finish coating and/or primer coating comprising the coating composition of claim 3.

12. A finish coating and/or primer coating comprising the coating composition of claim 4.

13. A finish coating on buildings, steel structures, automobiles, aircraft, other vehicles, general industrial machinery and/or fitments comprising the coating composition of claim 1.

14. A finish coating on buildings, steel structures, automobiles, aircraft, other vehicles, general industrial machinery and/or fitments comprising the coating composition of claim 2.

15. A finish coating on buildings, steel structures, automobiles, aircraft, other vehicles, general industrial machinery and/or fitments comprising the coating composition of claim 3.

16. A finish coating on buildings, steel structures, automobiles, aircraft, other vehicles, general industrial machinery and/or fitments comprising the coating composition of claim 4.

17. A method of using a coating composition comprising applying the coating composition of claim 1 on a substrate.

18. The method of claim 17 wherein the coating composition which is applied to the substrate is a finish coating, and

further comprising a step of applying a primer to the substrate prior to applying the coating composition of claim 1.